

Homework handout for homework #8.

Directions: Please submit this part of homework on a separate sheet.

Problem: Let $\begin{cases} dx/dt = x(3-x) - 2xy, \\ dy/dt = y(2-y) - xy. \end{cases}$

- (a) Does this system describe predator-prey, competing, or cooperating species? Please explain.
- (b) Use the system to describe what will happen in the long run to $x(t)$ and $y(t)$ if $x(0) = 0$.
- (c) Find all equilibrium points of the system.
- (d) Let $F(x, y) = (x(3-x) - 2xy, y(2-y) - xy)$ be the vector field for this system. Draw $F(1, 0)$, $F(0, 4)$, $F(1, 1)$, $F(3, 2)$.